

PATENT

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE
BEFORE THE BOARD OF PATENT APPEALS AND INTERFERENCES

In re patent
appln. of: Albert J. Frattarola

Serial No.: 09/803,221

Filed: March 9, 2001


For: **FLOATING CAPTIVE SCREW**

Examiner: Flemming Saether

Art Unit: 3679

Att'y Docket: 061-01

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APPEAL BRIEF

Sir:

This appeal brief is submitted under certificate of mailing on Wednesday, November 30, 2004 in support of Notice of Appeal filed August 9, 2004, in response to the Examiner's Action mailed April 7, 2004 in the above-referenced patent application finally rejecting claims 1-5. A petition for a two-month extension of time for response accompanies this brief.

I. Real Party in Interest

This application has been assigned to Southco, Inc., a Delaware corporation.

II. Related Appeals and Interferences

There are no related appeals or interferences.

III. Status of the Claims

The claims in the application are claims 1-5.

No claims stand allowed.

Claims 1-5 stand finally rejected.

The claims on appeal are claims 1-5.

IV. Status of Amendments

Claim 3 was amended to correct punctuation subsequent to the final rejection in the Amendment filed August 27, 2002. The amendment was entered for purposes of appeal by an Advisory Action dated September 16, 2002.

V. Summary of the Claimed Subject Matter

As shown in Fig. 1, the present invention provides a captive screw 10 including a ferrule 20, a screw 40, and a spring 50 (specification, page 2, lines 23-25). The screw (Figure 2) has a head 42, a shank 44 adapted to pass through the ferrule 20, a threaded portion 46 at the end of the shank 44 opposite the head 42, and a collar 48 formed on the shank 44 proximate the threaded portion 46 (specification, page 2, lines 24 - 27). The screw 40 (Figure 7) is captivated on the ferrule 20 between the head 42 and the collar 48 (page 3, lines 2 - 23). The spring 50 (Figure 7) extends on the shank 44 of the screw 40 between the head 42 and the ferrule 20. Preferably, the ferrule 20 (Figures 4 - 6) has a generally cylindrical exterior surface having a plurality of knurls 22 for securing the captive screw 10 in a preformed aperture in a first structure 110 (Figure 7), such as a lever (specification, page 2, lines 28 - 33). Is also preferred that the ferrule 20 (Figures 4 - 6) be formed with an annular collapsible ring section 24 formed on the

bottom having a generally circular opening 26 large enough to permit the threads 46 and collar 48 the screw 40 to pass through but not large enough to permit the spring 50 to pass through (specification, page 3, lines 2 – 8). When the captive screw 10 is assembled, the annular ring section 24 is bent upwardly to captivate the screw 10 on the ferrule 20. Preferably, the ferrule 20 has an annular lip 28 formed on the exterior cylindrical surface proximate the top of the ferrule 20 for limiting the penetration of the ferrule 20 in the preformed aperture in the first structure, as well as an annular circumferential groove 30 formed in the exterior cylindrical surface of the ferrule 20 immediately adjacent and below the annular lip 28 for receiving the plastic flow of material when the ferrule is pressed into the preformed aperture (specification 3, lines 13 – 23).

VI. Issues Presented

A. Whether the Examiner erred in his conclusion that claim 1 is unpatentable as obvious over U.S. Patent 5,462,395 ("Damm") in view of U.S. Patent 3,465, 803 ("Ernest") under 35 U.S.C. 103(a).

B. Whether the Examiner erred in his alternative conclusion that claim 1 is unpatentable as obvious over U.S. Patent 3,465, 803 ("Ernest") in view of U.S. Patent 5,462,395 ("Damm") under 35 U.S.C. 103(a).

C. Whether the Examiner erred in his conclusion that claims 2-5 are unpatentable as obvious over Ernest in view of U.S. Patent 5,941,669 ("Aukzemas") under 35 U.S.C. 103(a).

VII. Grouping of Claims

The claims are grouped into Group A, consisting solely of claim 1; and Group B, consisting of claims 2-5.

VIII. Argument

The Examiner's rejections are not correct.

Claim 1 stands finally rejected under 35 U.S.C. 103(a) as being unpatentable over U.S. Patent 5,462,395 ("Damm") in view of U.S. Patent 3,465,803 ("Ernest").

Careful consideration and reversal of the Examiner's rejection are respectfully requested.

In making his final rejection, the Examiner stated that Damm discloses a captive screw comprising a ferrule (3) and a screw (2) including a head (4), a shank (8), a thread (10) and a collar (13) (referring also to Figure 8) formed on the shank proximate the thread. The Examiner stated that the screw is captive on the ferrule between the head and the collar. The Examiner acknowledged that Damm does not include a spring.

The Examiner nevertheless stated that Ernest discloses a captive screw including a spring (50) extending between a head (38) and a ferrule (10), and teaches that to provide a spring is known in the art by virtue of the disclosure of embodiments both with (Figs. 1-12) and without (Figs. 13-15) a spring.

The Examiner concluded that at the time the invention was made, it would have been obvious for one of ordinary skill in the art to provide the captive screw of Damm with a spring between the head a ferrule as disclosed in Ernest because Ernest teaches that it is well known to provide a spring to an otherwise unsprung captive screw. The Examiner explained that the spring would be operative to retract the screw and that this would facilitate installation.

Applicant notes that in the present invention, applicant's screw shaft passes freely through the ferrule, which follows from forming the opening in the ferrule slightly larger than the screw shaft diameter (page 3, lines 8-14), while Damm's screw 2 must be forced through the elastomeric body 3.

With respect to applicant's conclusion that that the ferrule (formed body 3) must be compressed for the device of Damm to operate as intended in support of the position that the shaft is only "into" the ferrule, the Examiner responded by disagreeing with applicant's conclusion because, according to the Examiner, in Damm, the figures (referencing for example Fig. 2) show a gap between the ferrule (3) and second part (28). The Examiner contended that it should be recognized that the isolation between the first and second parts is provided by elastic ring labeled 29.

In reply, applicant noted that the existence of a gap between the formed body 3 and the second part 28 is not inconsistent with compression of the formed body 3. The formed body 3 is made from an elastomer material (col. 6, lines 48-50) and Damm expressly discloses that when the screw 2 is tightened the "bearing area 6 of the head at the same time comes to rest on the surface of the flange 17 of the formed boy 3 and compresses the formed body 3." (col. 8, lines 19-22, emphasis added). While the Examiner noted that that the isolation between the first and second parts is provided by elastic ring 29, applicant suggested that the force of compression is transmitted from the screw head 4, through the formed body 3, through the first body 27, to the elastic ring 29, as is apparent, for example, in Figure 2.

Regarding Ernest, applicant argued that Ernest does not disclose the provision of a spring. The Examiner disagreed because Ernest clearly shows a spring (50) in the first disclosed embodiment. However, the Examiner's response suggested that the Examiner's misapprehends applicant's argument. Applicant agreed that Ernest discloses a spring, but only in the context of certain structural features, such that one of ordinary skill in the art is taught that springs cannot be added to springless captive

screws without substantial modifications. As previously noted, in order to provide a spring in Ernest's springless embodiments, the structure of the screw must be significantly modified (col. 5, lines 22-25).

The Examiner responded to applicant's argument that the skilled artisan would not be motivated to combine a spring as in Ernest with the device of Damm since it would destroy Damm's intention to have the screw be located at any intermediate position relative to the ferrule (formed body). The Examiner conceded that the spring would force the screw to a fully retracted position that would not allow for any intermediate position. However, the Examiner noted that Damm further discusses that it would be advantageous to pre-mount the first and second parts without danger of the surface of the second part being harmed by the screws (top of column 4). The Examiner stated that with this in mind, the inclusion of a spring to force the screw to the fully retracted position would ensure that in a pre-assembled condition, the threaded end of the screw would not protrude past the end of the ferrule so that there would be no danger of the screw harming the surface of the second part (see Damm Fig. 3 and Ernest Fig. 2). The Examiner concluded that the skilled artisan would have recognized this benefit of the spring and as such would have been motivated to combine the spring as in Ernest with the device of Damm. The Examiner further stated that in Damm there would be no benefit to the screw being positioned at any intermediate position other than the fully retracted position as exemplified by the drawings only shown the screw in the fully retracted and fully assembled position.

In reply, applicant noted that the "benefit" attributed by the Examiner to the hypothetical combination of Damm and Ernest, that the threaded end of the screw would not protrude past the end of the ferrule so that there would be no danger of the screw harming the surface of the second part has already been achieved by Damm's disclosed invention, such as disclosed at col. 3, line 63 – col. 4, line 5. One of ordinary skill in the art would appreciate that the Examiner's proposed addition of a spring, a third element,

would add nothing to Damm, while simultaneously raising the cost of the product, contrary to Damm's disclosed advantage of providing a connecting element "with only two individual parts" (col. 4, lines 25-26). The Examiner contended that there would be no benefit in Damm for the screw being positioned in any intermediate position, because Damm shows only the fully retracted and fully inserted positions in his figures. However, Damm emphasizes repeatedly in his disclosure that the frictional area pairing has the function of ensuring that "the screw can be brought or pushed into any intermediate position of its limited axial lift relative to the formed body and that it keeps this position after being let go." (col. 3, lines 52-26). Damm also discloses that his invention makes it "possible to push forward the screws . . . making use of the lift of the limited axial movement, so far that they protrude relative to the plane of the gasket with their free ends. The free ends can then be mated with the counterthreads in the second part much easier." (col. 5, lines 57-61) Thus, Damm expressly contradicts the Examiner's conclusion.

The hypothetical construct of Damm and Ernest proposed by the Examiner either would also likely be *inoperative* or have *significantly reduced utility* for Damm's purpose. In order to add the useless spring, the surface area of the friction area pairing would have to be reduced, diminishing the benefits provided by this feature of Damm's invention. In addition, the contact area between the underside of the head of the screw and the upper surface of the formed body would be reduced, reducing the amount of force that could be applied to the formed body to compress the formed body with significant geometrical distortion of the formed body.

Applicant respectfully requests careful consideration and reversal of the rejection of claim 1 entered under 35 U.S.C. 103(a) over Damm in view of Ernest for these reasons.

With respect to the alternative rejection wherein Ernest was used as the base reference, in making his final rejection the Examiner responded to applicant's argument

that there is no motivation for the combination. The Examiner noted that applicant argues that there would be no motivation for the collar in Damm without the compression gasket and if the collar were located anywhere along the shaft Ernest it would destroy the intended operation of Ernest. The Examiner stated his disagreement and responded that the skilled artisan concerned with Ernest would have recognized the teachings of Damm since that the collar would provide the same advantages to the device of Ernest as in Damm. In particular, the Examiner stated that the collar once combined with Ernest would provide a standoff feature as it does in Damm and the standoff feature would then allow an elastic material to be interposed therebetween. The Examiner concluded that the skilled artisan versed in the art would have recognized it would be advantageous to provided a sound decoupling between the plates 12 and 13 of Ernest as disclosed in Damm depending upon the particular application of the device. The Examiner further stated that once combined, regardless of where along the length of the shaft the collar were located, it would operate prevent the screw from being removed from the ferrule and thus it would provide the advantageous of not having the threads contact the ferrule which would protect the threads for damage.

In reply, the applicant contended that the neither reference provides any motivation for the combination proposed by the Examiner. The Examiner suggested modifying Ernest's screw by adding a collar such as disclosed by Damm. The Examiner did not dispute applicant's contention that this change, per se, would render Ernest non-functional. Instead, the Examiner proposed a further change – adding an element that is not disclosed in either of the cited references, namely "elastic material" to be "interposed" in some unspecified location. The Examiner suggested that one of ordinary skill in the art would recognize, depending on the application; that it would be advantageous to provide sound deadening between plates 12 and 13. This is Damm's goal, but is nowhere mentioned in Ernest. Further, one of ordinary skill in the art would recognize that merely putting elastic material between the two plates 12 and 13 would

not necessarily provide any sound deadening. Quite the opposite is true. In Damm's device, the first part is isolated by elastic material from the second part. In the Examiner's proposed hindsight-guided reconstruction of applicant's invention, the screw bears directly on the ferrule, which is rigidly attached to the first plate 12, and the screw is rigidly attached directly to the second plate 13. There would be no vibrational isolation provided by the proposed arrangement. Furthermore, in the Examiner's hypothetical device, the collar is so small it can be press fit through the ferrule. There is no reason to believe that such a small collar would be an effective standoff – it may simply be drawn into the nut on the second plate as the screw is tightened. Further, one skilled in the art would not expect that such a small standoff would initially seat the screw on top of the second plate, rather than at some lower level. The Examiner also claimed that the standoff would advantageously protect the screw threads from being damaged, by preventing contact of the threads with the ferrule. However, Ernest discloses a plastic locking element 56 which, from the drawings, serves this function, so that no such advantage would be realized by making the alteration proposed by the Examiner.

Careful consideration and reversal of the alternative rejection are respectfully requested for these reasons.

In sum, the combination of Damm and Ernest does not establish a *prima facie* case of obviousness. Reversal of the rejection entered under 35 U.S.C. 103(a) of claim 1 is respectfully requested.

Claims 2-5 stand finally rejected under 35 U.S.C. 103(a) as being unpatentable over Ernest as modified by Damm, and further in view of Aukzemas.

Careful consideration and reversal of the rejection of claim 2-5 entered over Ernest in view of Damm and further in view of Aukzemas are respectfully requested.

In making his final rejection, the Examiner noted that Aukzemas discloses the particulars of the ferrule, and in particular that the ferrule is disclosed as having a

knurled outer surface including a groove (32) and annular lip (generally at 30). The Examiner concluded that at the time the invention was made, it would have been obvious for one of ordinary skill in the art to modify the exterior of the ferrule of Ernest as disclosed by Aukzemas in order to improve attachment to the panel. The Examiner further states that the ring on the ferrule being bent is a product-by-process limitation wherein it is merely the final product considered for patentability.

Applicant respectfully points out that there is nothing in the combination of Ernest, Damm or Aukzemas, or any subcombination thereof, that would disclose or suggest the presently claimed invention to one of ordinary skill in the art. In particular, as argued above, the combination of Ernest and Damm does not suggest the modification of adding a collar to Ernest's screw as proposed by the Examiner in rejecting independent claim 1, from which the present claims depend. Each of dependent claims 2-5 ultimately depend from claim 1, and thus each incorporates the limitation of the required collar. Thus, the proposed combination of Ernst, Damm and Aukzemas does not make out a *prima facie* case of obviousness, because the combination does not include all the limitations of claims 2-5.

Reconsideration and withdrawal of the rejection entered under 35 U.S.C. 103(a) of claims 2-5 over the combination of Ernst, Damm and Aukzemas are respectfully requested for these reasons.

IX. Conclusion

As all claims as amended are believed to be in condition for allowance, an early favorable action and reversal of the rejections entered by the Examiner are earnestly solicited.

Respectfully submitted,



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CLAIMS APPENDIX

CLAIMS ON APPEAL:

1. A captive screw including:
 - a ferrule,
 - a screw having a head, a shank adapted to pass through the ferrule, a threaded portion at the end of the shank opposite the head, and a collar formed on the shank proximate the threaded portion; and
 - a spring,
 - the screw being captivated on the ferrule between the head and the collar, the spring extending on the shank of the screw between the head and the ferrule.
2. A captive screw according to claim 1 wherein the ferrule has a generally cylindrical exterior surface having a plurality of knurls for securing the captive screw in a preformed aperture in a first structure.
3. A captive screw according to claim 1 wherein the ferrule is formed with an annular collapsible ring section formed on the bottom having a generally circular opening large enough to permit the threads, collar, and the screw to pass through but not large enough to permit the spring to pass through, the annular ring section being bent upwardly to captivate the screw on the ferrule during assembly of the captive screw.
4. A captive screw according to claim 2 wherein the ferrule has an annular lip formed on the exterior cylindrical surface proximate the top of the ferrule for limiting the penetration of the ferrule in the preformed aperture in the first structure.
5. A captive screw according to claim 4 wherein the ferrule has an annular circumferential groove formed in the exterior cylindrical surface of the ferrule

immediately adjacent and below the annular lip for receiving the plastic flow of material when the ferrule is pressed into the preformed aperture.